

CLAIMS

1. A method of processing data in a computer system comprising at least one host and at least one storage system, the method comprising an act of:

(A) transmitting at least one request, from the at least one host to the at least one storage system, requesting that the at least one storage system store a data unit until at least the expiration of a retention period, wherein the at least one request identifies the retention period indirectly by including information that enables the at least one storage system to determine the retention period.

2. The method of claim 1, wherein the information that enables the at least one storage system to determine the retention period is information identifying a retention class to which the data unit belongs with at least one other data unit.

3. The method of claim 2, wherein the data unit has content and the act (A) comprises transmitting a request that includes, within the content of the data unit, the information that enables the at least one storage system to determine the retention period.

4. The method of claim 3, further comprising an act of:

(B) transmitting a second request, from the at least one host to the at least one storage system, requesting that the at least one storage system modify the retention period of the retention class.

5. The method of claim 4, wherein the second request is a request to reduce the retention period of the retention class.

6. The method of claim 4, wherein the second request is a request to increase the retention period of the retention class.

7. The method of claim 4, wherein the second request comprises an event command indicating the occurrence of an event.

8. The method of claim 7, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced.

9. The method of claim 4, wherein the second request specifies that the retention period of the retention class be reduced and the manner in which the length of the retention period of the retention class is to be reduced.

10. At least one computer readable medium encoded with instructions that, when executed on a computer system, perform a method of processing data, the computer system comprising at least one host and at least one storage system, the method comprising an act of:

(A) transmitting at least one request, from the at least one host to the at least one storage system, requesting that the at least one storage system store a data unit until at least the expiration of a retention period, wherein the at least one request identifies the retention period indirectly by including information that enables the at least one storage system to determine the retention period.

11. The at least one computer readable medium of claim 10, wherein the information that enables the at least one storage system to determine the retention period is information identifying a retention class to which the data unit belongs with at least one other data unit.

12. The at least one computer readable medium of claim 11, wherein the data unit has content and the act (A) comprises transmitting a request that includes, within the content of the data unit, the information that enables the at least one storage system to determine the retention period.

13. The at least one computer readable medium of claim 12, wherein the method further comprises an act of:

(B) transmitting a second request, from the at least one host to the at least one storage system, requesting that the at least one storage system modify the retention period of the retention class.

14. The at least one computer readable medium of claim 13, wherein the second request is a request to reduce the retention period of the retention class.

15. The at least one computer readable medium of claim 13, wherein the second request is a request to increase the retention period of the retention class.

16. The at least one computer readable medium of claim 13, wherein the second request comprises an event command indicating the occurrence of an event.

17. The at least one computer readable medium of claim 16, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced.

18. The at least one computer readable medium of claim 13, wherein the second request specifies that the retention period of the retention class be reduced and the manner in which the length of the retention period of the retention class is to be reduced.

19. A host computer for use in a computer system that includes the host computer and at least one storage system, the host computer comprising:

at least one storage device; and

at least one controller, coupled to the at least one storage device, to transmit at least one request to the at least one storage system requesting that the at least one storage system store a data unit until at least the expiration of a retention period, wherein the at least one request identifies the retention period indirectly by including information that enables the at least one storage system to determine the retention period.

20. The host computer of claim 19, wherein the information that enables the at least one storage system to determine the retention period is information identifying a retention class to which the data unit belongs with at least one other data unit.

21. The host computer of claim 20, wherein the data unit has content and the at least one controller is adapted to transmit a request that includes, within the content of the data unit, the information that enables the at least one storage system to determine the retention period.

22. The host computer of claim 21, wherein the at least one controller is adapted to transmit a second request to the at least one storage system, requesting that the at least one storage system modify the retention period of the retention class.

23. The host computer of claim 22, wherein the second request is a request to reduce the retention period of the retention class.

24. The host computer of claim 22, wherein the second request is a request to increase the retention period of the retention class.

25. The host computer of claim 22, wherein the second request comprises an event command indicating the occurrence of an event.

26. The host computer of claim 25, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced.

27. The host computer of claim 22, wherein the second request specifies the retention period to be reduced and the manner in which the length of the retention period of the retention class is to be reduced.

28. A host computer for use in a computer system that includes the host computer and at least one storage system, the host computer comprising:

means for transmitting at least one request to the at least one storage system requesting that the at least one storage system store a data unit until at least the expiration of a retention period, wherein the at least one request identifies the retention period indirectly by including information that enables the at least one storage system to determine the retention period.

29. A method of processing data in a computer system comprising at least one host and at least one storage system, the method comprising acts of:

(A) receiving a request, from the host, to delete a unit of data stored on the storage system;

(B) determining whether a previously-defined retention period for the unit of data has expired by performing acts of;

(B1) retrieving first information, associated with the unit of data, that identifies a manner of accessing second information specifying the previously-defined retention period; and

(B2) using the first information to retrieve the second information specifying the previously-defined retention period; and

(C) when it is determined in the act (B) that the retention period for the unit of data has not expired, denying the request to delete the unit of data.

30. The method of claim 29, further comprising an act (D) of deleting the unit of data when it is determined in the act (B) that the retention period for the unit of data has expired.

31. The method of claim 29, wherein the first information is information identifying a retention class to which the unit of data belongs, wherein the second information is a retention period associated with the retention class, and wherein the method further comprises an act of maintaining, on the at least one storage system, a record associating the retention period with the retention class.

32. The method of claim 31, wherein the act (B2) further comprises accessing the record on the storage system to retrieve the previously-defined retention period.

33. The method of claim 31, further comprising an act of:

(D) receiving, at the at least one storage system, a second request from the at least one host, requesting that the at least one storage system modify the retention period of the retention class.

34. The method of claim 33, wherein the second request is a request to reduce the retention period of the retention class.

35. The method of claim 33, wherein the second request is a request to increase the retention period of the retention class.

36. The method of claim 33, further comprising an act of:
modifying the second information specifying the retention period in response to the second request.

37. The method of claim 36, wherein the act of modifying further comprises modifying the second information without modifying the content of the unit of data.

38. The method of claim 33, wherein the second request comprises an event command indicating the occurrence of an event.

39. The method of claim 38, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced, and wherein the act (D) further comprises an act of determining the manner of reducing the retention period of the retention class by referring to information stored within or accessible to the storage system.

40. The method of claim 33, wherein the second request specifies the manner in which the length of the retention period of the retention class is to be reduced.

41. The method of claim 34, wherein the act (D) further comprises acts of:
(D1) determining whether the retention period for the retention class is permitted to be reduced; and
(D2) reducing the retention period only when the retention period for the retention class is permitted to be reduced.

42. The method of claim 41, wherein the act (D1) further comprises an act of determining whether the retention period of the retention class is designated as capable of being reduced.

43. The method of claim 42, wherein the act (D1) further comprises determining whether the retention period of the retention class is designated as capable of being reduced by examining the retention period.

44. The method of claim 42, wherein the act (D1) further comprises determining whether the retention period of the retention class is designated as capable of being reduced by examining a flag associated with the retention class.

45. At least one computer readable medium encoded with instructions that, when executed on a computer system, perform a method of processing data, the computer system comprising at least one host and at least one storage system, the method comprising acts of:

(A) receiving a request, from the host, to delete a unit of data stored on the storage system;

(B) determining whether a previously-defined retention period for the unit of data has expired by performing acts of;

(B1) retrieving first information, associated with the unit of data, that identifies a manner of accessing second information specifying the previously-defined retention period; and

(B2) using the first information to retrieve the second information specifying the previously-defined retention period; and

(C) when it is determined in the act (B) that the retention period for the unit of data has not expired, denying the request to delete the unit of data.

46. The at least one computer readable medium of claim 45, wherein the method further comprises an act (D) of deleting the unit of data when it is determined in the act (B) that the retention period for the unit of data has expired.

47. The at least one computer readable medium of claim 45, wherein the first information is information identifying a retention class to which the unit of data belongs, wherein the second information is a retention period associated with the retention class, and wherein the method further comprises an act of maintaining, on the at least one storage system, a record associating the retention period with the retention class.

48. The at least one computer readable medium of claim 47, wherein the act (B2) further comprises accessing the record on the storage system to retrieve the previously-defined retention period.

49. The at least one computer readable medium of claim 47, wherein the method further comprises an act of:

(D) receiving, at the at least one storage system, a second request from the at least one host, requesting that the at least one storage system modify the retention period of the retention class.

50. The at least one computer readable medium of claim 49, wherein the second request is a request to reduce the retention period of the retention class.

51. The at least one computer readable medium of claim 49, wherein the second request is a request to increase the retention period of the retention class.

52. The at least one computer readable medium of claim 49, wherein the method further comprises an act of:

modifying the second information specifying the retention period in response to the second request.

53. The at least one computer readable medium of claim 52, wherein the act of modifying further comprises modifying the second information without modifying content of the unit of data.

54. The at least one computer readable medium of claim 49, wherein the second request comprises an event command indicating the occurrence of an event.

55. The at least one computer readable medium of claim 54, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced and wherein the act (D) further comprises an act of determining the manner of reducing the retention period of the retention class by referring to information stored within or accessible to the storage system.

56. The at least one computer readable medium of claim 49, wherein the second request specifies the retention period to be reduced and the manner in which the length of the retention period of the retention class is to be reduced.

57. The at least one computer readable medium of claim 50, wherein the act (D) further comprises acts of:

(D1) determining whether the retention period for the retention class is permitted to be reduced; and

(D2) reducing the retention period only when the retention period for the retention class is permitted to be reduced.

58. The at least one computer readable medium of claim 57, wherein the act (D1) further comprises an act of determining whether the retention period of the retention class is designated as capable of being reduced.

59. The at least one computer readable medium of claim 58, wherein the act (D1) further comprises determining whether the retention period of the retention class is designated as capable of being reduced by examining the retention period.

60. The at least one computer readable medium of claim 58, wherein the act (D1) further comprises determining whether the retention period of the retention class is designated as capable of being reduced by examining a flag associated with the retention class.

61. A storage system for use in a computer system including the storage system and at least one host, the storage system comprising:

at least one storage device to store a unit of data; and

at least one controller that is adapted to:

receive a request, from the host, to delete the unit of data; and

determine whether a retention period for the unit of data has expired by performing acts of:

retrieving first information, associated with the unit of data, that identifies a manner of accessing second information specifying the previously-defined retention period; and

using the first information to retrieve the second information specifying the previously-defined retention period; and

when it determines that the retention period for the unit of data has not expired, deny the request to delete the unit of data.

62. The storage system of claim 61, wherein the at least one controller is adapted to delete the unit of data when it determines that the retention period for the unit of data has expired.

63. The storage system of claim 61, wherein the first information is information identifying a retention class to which the unit of data belongs, wherein the second information is a retention period associated with the retention class, and wherein the at least one controller is adapted to maintain, on the storage system, a record associating the retention period with the retention class.

64. The storage system of claim 63, wherein the at least one controller accesses the record on the storage system to retrieve the previously-defined retention period.

65. The storage system of claim 63, wherein the at least one controller is adapted to receive a second request from the at least one host requesting that the at least

one storage system modify the retention period of the retention class, and to modify the second information specifying the retention period in response to the second request.

66. The storage system of claim 65, wherein the second request comprises an event command indicating the occurrence of an event.

67. The storage system of claim 66, wherein the event command does not specify the manner in which the retention period of the retention class is to be reduced and wherein the at least one controller is adapted to determine the manner of reducing the retention period of the retention class by referring to information stored within or accessible to the storage system.

68. The storage system of claim 65, wherein the second request includes third information that specifies the retention period to be reduced and the manner in which the length of the retention period of the retention class is to be reduced, and the at least one controller is adapted to reduce the length of the retention period based on the third information.

69. The storage system of claim 65, wherein the at least one controller is adapted to, in response to a second request that seeks to reduce the retention period:

determine whether the retention period for the retention class is permitted to be reduced; and

reduce the retention period only when the retention period for the retention class is permitted to be reduced.

70. The storage system of claim 69, wherein the at least one controller is adapted to determine whether the retention period of the retention class is capable of being reduced by determining whether the retention period is designated as capable of being reduced.

71. The storage system of claim 70, wherein the at least one controller is adapted to determine whether the retention period of the retention class is designated as capable of being reduced by examining the retention period.

72. The storage system of claim 70, wherein the at least one controller is adapted to determine whether the retention period of the retention class is designated as capable of being reduced by examining a flag associated with the retention class.

73. The storage system of claim 61, wherein the at least one controller comprises:

means for receiving a request, from the host, to delete the unit of data stored on the storage system;

means for determining whether a previously-defined retention period for the unit of data has expired by:

retrieving first information, associated with the unit of data, that identifies a manner of accessing second information specifying the previously-defined retention period; and

using the first information to retrieve the second information specifying the previously-defined retention period; and

means for, when it is determined that the retention period for the unit of data has not expired, denying the request to delete the unit of data.